IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION of

SEDDIGH et al.   Group Art Unit: Not Assigned

Appln. No.: 09/750,174   Examiner: Not Assigned

Filed: December 29, 2001

For: METHOD AND SYSTEM FOR A ROUTING MECHANISM
        TO SUPPORT TWO-WAY RSVP RESERVATIONS

*   *   *   *   *

March 21, 2001

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents
Washington, D.C. 20231

Sir:

Prior to examination on the merits, please amend the above-identified patent

application as follows:

IN THE SPECIFICATION:

Page 10, delete the whole paragraph starting in line 19 and replace it with the

following new paragraph

If the reservation is successful, determined at act 650, the egress policy enforcement

device forwards the RESV message to the next egress policy enforcement device at 670. If

the reservation is not successful (the required resources are not granted), the egress policy

enforcement device constructs error messages and sends to both the sender 310 and the

receiver 320. At act 660, an RESV_ERR message is constructed and sent, at 665 to the

receiver 320, signaling that the reservation request initiated by the receiver 320 has failed. The egress policy enforcement device may also construct a PATH_ERR message, at act 670, and send it, at act 675, to the sender 310 to indicate a failure in reserving the network resource in the reverse direction.

Page 11, delete the whole paragraph starting in line 21 and replace it with the following new paragraph

FIG. 8 and FIG. 9 show the flowchart for the receiver 320. Once the sender 310 initiates a 3-way handshake, if the receiver 320 receives a PATH message at 810, it indicates that the resource reservation for the forward direction is successful. The receiver 320 responds to the PATH message and, at the same time, initiates the reservation for the reverse direction by constructing an RESV message. To do so, the PATH message is processed at 820. The PATH message has a NEXT HOP object that provides the IP address of the 1st router to which the RESV message must be sent. Such information may be extracted at 830 and used to construct an RESV message at 840. The RESV message generated by the receiver 320 carries both the reservation information for the reverse direction. The RESV message is sent from the receiver 320 to the egress policy enforcement device of the last domain between the sender 310 and the receiver 320. The receiver 320 marks the time at 853 to establish the time reference to be used in a time-out mechanism and then waits for return messages.

Page 17, delete the whole paragraph starting in line 7 and replace it with the following new paragraph

If the received message is a RESV1+PATH2 message, it is in the second pass of the 4-way handshake. In this pass, an ingress policy enforcement device performs both the function of reserving resources needed for the forward direction (based on the RESV1 message).

Page 18, delete the whole paragraph starting in line 17 and replace it with the following new paragraph

If the message received at 1510 is an RESV1+PATH2 message, the egress policy enforcement device adds its own address to the NEXT_HOP object of PATH2 at 1536 and forwards the RESV1+PATH2 message at 1537 to the ingress policy enforcement device of the same domain. The egress policy enforcement device then goes back to a waiting mode at 1510 to intercept the next message.

Page 19, delete the whole paragraph starting in line 17 and replace it with the following new paragraph

FIG. 16 and FIG. 17 show the flowchart for the receiver 1020 in a 4-way handshake scheme. After the 4-way handshake is initiated by the sender 1010, the receiver 1020 receives the PATH1 message and uses it to construct the RESV1 message which is sent back to the sender. The RESV1 message carries the reservation request for the forward direction and travels along the reverse path as the PATH1 message. The receiver determines the op address of the 1st egress router using the NEXT_HOP object in the PATH1 message."

Page 20, delete the whole paragraph starting in line 14 and replace it with the following new paragraph

A return message received at the receiver 1020 may be an RESV1_ERR message, which indicates that the reservation initiated by the receiver has failed, or a coupled RESV1_Confirm/RESV2 message, which indicates that the reservation in both directions has succeeded. Depending on the type of message received the receiver 1020 functions differently, as illustrated in FIG. 17. If a message is received and the received message is an RESV2_ERR message at 1640, the receiver 1020 also aborts the 4-way handshake at 1670. If the timely received message is an RESV2/RESV1_Confirm message at 1645, the receiver 1020 constructs an acknowledgement message RESV2_Confirm at 1690 and sends it directly back to the sender 1010 at 1655 to complete the 4-way handshake. A 2-way communication may then be started at 1660.

IN THE CLAIMS:

Please enter the following amended claims:

7.   (Amended) A method for an egress policy enforcement device, said egress being defined in the direction from a first party to a second party, said first party initiating a two-way communication, said egress policy enforcement device connecting to a network, said method comprising:

intercepting a message, said message being either a PATH message or an RESV message, said PATH message carrying a resource reservation request for communication from said first party to said second party, said RESV message carrying path information and a resource reservation request for communication from said second party to said first party;

adding an address to said PATH message if said message is a PATH message, said address identifying said egress policy enforcement device, said adding resulting in a revised PATH message;

determining a forwarding address for forwarding said revised PATH message;

forwarding said revised PATH message to said forwarding address;

reserving needed network resource if said message is an RESV message, said needed network resource being specified by the resource reservation request carried in said RESV message, said reserving yielding a decision of either positive, representing granting the needed network resource, or negative, representing not granting the needed network resource;

determining a next hop address if said decision is positive;

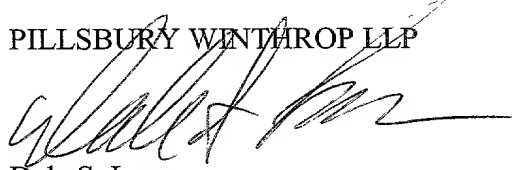forwarding said RESV message to said next hop address; and

sending an RESV_ERR message to said second party if said decision is negative.

REMARKS

By this Preliminary Amendment, claim 7 has been amended and no new matter has been added to the application. Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached Appendix is captioned **"Version with makings to show changes made"**. Consideration and an early action on the merits is respectfully requested.

Respectfully submitted,

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APPENDIX

"Version With Makings To Show Changes Made"

IN THE SPECIFICATION:

Page 10, delete the whole paragraph starting in line 19 and replace it with the following new paragraph

If the reservation is successful, determined at act 650, the egress policy enforcement device forwards the RESV message to the next egress policy enforcement device at 670 [using the addresses in the NEXT_HOP object of the RESV message]. If the reservation is not successful (the required resources are not granted), the egress policy enforcement device constructs error messages and sends to both the sender 310 and the receiver 320. At act 660, an RESV_ERR message is constructed and sent, at 665 to the receiver 320, signaling that the reservation request initiated by the receiver 320 has failed. The egress policy enforcement device may also construct a PATH_ERR message, at act 670, and send it, at act 675, to the sender 310 to indicate a failure in reserving the network resource in the reverse direction.

Page 11, delete the whole paragraph starting in line 21 and replace it with the following new paragraph

FIG. 8 and FIG. 9 show the flowchart for the receiver 320. Once the sender 310 initiates a 3-way handshake, if the receiver 320 receives a PATH message at 810, it indicates that the resource reservation for the forward direction is successful. The receiver 320 responds to the PATH message and, at the same time, initiates the reservation for the reverse direction by constructing an RESV message. To do so, the PATH message is processed at 820. [The PATH message has an NEXT_HOP object that contains the route information from the sender 310 to the receiver 320] The PATH message has a NEXT HOP object that

provides the IP address of the 1st router to which the RESV message must be sent. Such information may be extracted at 830 and used to construct an RESV message at 840. The RESV message generated by the receiver 320 carries both the reservation information for the reverse direction [as well as the path information instructing how the RESV message should gravel from the receiver 320 to the sender 310 (NEXT_HOP)]. The RESV message is sent from the receiver 320 to the egress policy enforcement device of the last domain between the sender 310 and the receiver 320. The receiver 320 marks the time at 853 to establish the time reference to be used in a time-out mechanism and then waits for return messages.

Page 17, delete the whole paragraph starting in line 7 and replace it with the following new paragraph

If the received message is a RESV$_1$+PATH$_2$ message, it is in the second pass of the 4-way handshake. In this pass, an ingress policy enforcement device performs both the function of reserving resources needed for the forward direction (based on the RESV$_1$ message) [and the function of processing the second PATH message, PATH$_2$, for the reverse direction].

Page 18, delete the whole paragraph starting in line 17 and replace it with the following new paragraph

If the message received at 1510 is an RESV$_1$+PATH$_2$ message, the egress policy enforcement device adds its own address to the NEXT_HOP object of PATH$_2$ at 1536 and forwards the RESV$_1$+PATH$_2$ message at 1537 to the ingress policy enforcement device of the same domain [(in the reverse direction)]. The egress policy enforcement device then goes back to a waiting mode at 1510 to intercept the next message.

Page 19, delete the whole paragraph starting in line 17 and replace it with the following new paragraph

FIG. 16 and FIG. 17 show the flowchart for the receiver 1020 in a 4-way handshake scheme. [Once a 4-way handshake is initiated by the sender 1010, when the receiver 1020 receives a PATH1 message at 1610, the NEXT_HOP object of PATH1 message contains the addresses of all the edge policy enforcement devices that PATH1 travels through. The NEXT_HOP object defines a path between the sender 1010 and the receiver 1020 and this path is used to construct a RESV1 message at 1620. The RESV1 message carries also the reservation request for the forward direction and travels along the path defined by the NEXT_HOP from PATH1] After the 4-way handshake is initiated by the sender 1010, the receiver 1020 receives the PATH1 message and uses it to construct the RESV1 message which is sent back to the sender. The RESV1 message carries the reservation request for the forward direction and travels along the reverse path as the PATH1 message. The receiver determines the op address of the 1st egress router using the NEXT_HOP object in the PATH1 message."

Page 20, delete the whole paragraph starting in line 14 and replace it with the following new paragraph

A return message received at the receiver 1020 may be an RESV1_ERR message, which indicates that the reservation [for the reverse direction] initiated by the receiver has failed, or a coupled RESV1_Confirm/RESV2 message, which indicates that the reservation in both directions has succeeded. Depending on the type of message received the receiver 1020 functions differently, as illustrated in FIG. 17. If a message is received and the received message is an RESV2_ERR message at 1640, the receiver 1020 also aborts the 4-way

handshake at 1670. [If a message is received and the received message is an RESV2_ERR message at 1640, the receiver 1020 also aborts the 4-way handshake at 1670.] If the timely received message is an RESV2/RESV1_Confirm message at 1645, the receiver 1020 constructs an acknowledgement message RESV2_Confirm at 1690 and sends it directly back to the sender 1010 at 1655 to complete the 4-way handshake. A 2-way communication may then be started at 1660.

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7.   (Amended) A method for an egress policy enforcement device, said egress being defined in the direction from a first party to a second party, said first party initiating a two-way communication, said egress policy enforcement device connecting to a network, said method comprising:

intercepting a message, said message being either a PATH message or an RESV message, said PATH message carrying a resource reservation request for communication from said first party to said second party, said RESV message carrying path information and a resource reservation request for communication from said second party to said first party;

adding an address to said PATH message if said message is a PATH message, said address identifying said egress policy enforcement device, said adding resulting in a revised PATH message;

determining a forwarding address for forwarding said revised PATH message;

forwarding said revised PATH message to said forwarding address;

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reserving needed network resource if said message is an RESV message, said needed network resource being specified by the resource reservation request carried in said RESV message, said reserving yielding a decision of either positive, representing granting the needed network resource, or negative, representing not granting the needed network resource;

determining a next hop address if said decision is positive[,said next hope address being determined from the path information carried ins aid RESV message];

forwarding said RESV message to said next hop address; and

sending an RESV_ERR message to said second party if said decision is negative.